H0541-TMA/RECR

RECRA ENVIRONMENTAL INC.

RECEIVED FEB 14 2000 EDMC

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L166
SDG/SAF #: H0541/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 09-23-99

GC/MS VOLATILE

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 10-01-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The required holding time for analysis was met.

3. Non-target compounds were not detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blank contained the common laboratory contaminant Methylene Chloride and the target compound 2-Butanone at levels less than the CRQL.

JAN 2000 RECEIVED Data Log In

by J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-11-99
Date

som\group\data\voa\tnu09166.doc

01

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 11/04/99 16:44

RFW Batch Number: **9909L166** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1a

	Cust ID:	B0WBT3	B0WBT3	B0WBT3	VBLKUV	VBLKUV BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LVN322-MB1	99LVN322-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.02	1.02	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	Toluene-d8	106 %	102 %	106 %	101 %	102 %
	Bromofluorobenzene	101 %	97 %	100 %	98 %	98 %
	1,2-Dichloroethane-d4	101 %	98 %	106 %	78 %	79 %
Chloromethane		10 U	11 U	11 U	10 U	10 U
Bromomethane		10 U	11 U	11 U	10 U	10 U
Vinyl Chloride		10 U	11 U	11 U	10 U	10 U
Chloroethane		10 U	11 U	11 U	10 U	10 U
Methylene Chloride		8 B	10 B	9 B	2 J	2 JB
Acetone		7 J	5 J	4 J	10 U	10 U
Carbon Disulfide		5 U	6 U	6 U	5 U	5 U
1,1-Dichloroethene		5 U	98 %	98 %	5 U	97 %
1,1-Dichloroethane		5 U	6 U	6 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	6 U	6 U	5 U	5 U
Chloroform		5 U	6 U	6 U	5 U	5 U
1,2-Dichloroethane		5 U	6 U	6 U	5 U	5 U
2-Butanone		3 JB	2 JB	2 JB	1 J	1 JB
1,1,1-Trichloroethane		5 U	6 U	6 U	5 U	5 U
Carbon Tetrachloride		5 U	6 U	6 U	5 U	5 U
Bromodichloromethane		5 U	6 U	6 U	5 U	5 U
1,2-Dichloropropane		5 U	6 U	6 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	6 U	6 U	5 U	5 U
Trichloroethene		5 U	101 %	105 %	5 U	97 %
Dibromochloromethane		5 U	6 U	6 U	5 U	5 U
1,1,2-Trichloroethane		5 U	6 U	6 U	5 U	5 U
Benzene		5 U	101 %	105 %	5 U	91 %
Trans-1,3-Dichloropropene		5 U	6 U	6 U	5 U	5 U
Bromoform		5 U	6 U	6 U	5 U	5 U
4-Methyl-2-pentanone		10 U	11 U	11 U	10 U	10 U
2-Hexanone		10 U	11 U	11 U	10 U	10 U
Tetrachloroethene		5 U	6 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	6 U	6 U	5 U	5 U
Toluene		5 U	108 %	112 %	5 U	100 %

*= Outside of EPA CLP QC limits.

11-09-99

RFW Batch Number: 9909L166 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1b

	Cust ID:	B0WBT3	B0WBT3	B0WBT3	VBLKUV	VBLKUV BS
	RFW#:	001	001 MS	001 MSD	99LVN322-MB1	99LVN322-MB1
Chlorobenzene		5 U	102 %	106 %	5 U	98 %
Ethylbenzene		5 U	6 U	6 U	5 U	5 U
Styrene		5 U	6 U	6 U	5 U	5 U
Xylene (total)		5 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WBT3	001	S	99LVN322	09/21/99	N/A	10/01/99
B0WBT3	001 MS	S	99LVN322	09/21/99	N/A	10/01/99
B0WBT3	001 MSD	S	99LVN322	09/21/99	N/A	10/01/99
LAB QC:						
VBLKUV	MB1	S	99LVN322	N/A	N/A	10/01/99
VBLKUV	MB1 BS	S	99LVN322	N/A	N/A	10/01/99

11-08-99

RECRA LabNet Use Only
9909L166

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) metals

Client: TMU Hanford B99-078

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 9-23-99 Date Due: 10/23/99

Account #:

	VOA	BNA	Pest/PCB	Herb				Metal	CN				
Refrigerator #	1	6 —											
#/Type Container – Liquid													
#/Type Container – Solid	1AG	1AG —					—	1AG —					
Volume – Liquid													
Volume – Solid	100ml	250ml —					—	500ml —					
Preservatives	–	–						–					
Analyses Requested	ORGANIC							INORG					

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	O824H O8Z5C	O825H ODRO	OPCB			ICR6	Met(1)	ICNTO	IN3N2 INH3N	ISFD	IPH ICCL	ICFL ICSO4 ICPO4 ICNO3 ICNO2
001	BOWBT3	X	X	S	9-21-99	1250	✓	✓	X			X	✓	X	X	X		X

Special Instructions:

COMPOSITE WASTE

Saf# B99-078

DATE/REVISIONS:
1. Met(1) = Recra + Be, Cu, Ni, V, Zn
2.
3. 11/3/99 SB and TL added to all metals samples per client
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill #: ★
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 5.5 °C

Relinquished by	Received by	Date	Time
Fed Ex	TMurray	9-23-99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-122	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code	Data Turnaround
Bowers/Trice	Chris Cearlock 372-9574	TRENT, SJ	8N	45 Days
Project Designation	**Sampling Location**	**SAF No.**		
200 Area Source characterization - 200-CW-1 OU	200 B pond (B8758) >15'	B99-078		
Ice Chest No.	**Field Logbook No.**	**Method of Shipment**		
ERC 96-063	EL-1511	Fed Ex		
Shipped To	**Offsite Property No.**	**Bill of Lading/Air Bill No.**		
~~TMA/RCRA~~ DTB 9-21-99 RCRA	A9902666	4235 1952 96604		
		COA B20CW1 671C		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
Special Handling and/or Storage	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time								
B0WBT2 9-21-99 DTB	Soil										
B0WBT3	Soil	9-21-99	1250	X	X		X			Dom Cal	
B0WBT4 DTB	Soil										
B0WBT5 9-21-99	Soil										

CHAIN OF POSSESSION

Sign/Print Names		
Relinquished By Doug Bowers 9-21-99/1630	Received By Doug Bowers 9-21-99/1630	
Relinquished By Doug Bowers 9-21-99/1630	Received By Doug Bowers 9-21-99/1630	
Relinquished By Doug Bowers 9-22-99 1100	Received By Doug Bowers 9/22/99 1100	
Relinquished By Doug Bowers 9-22-99 1400	Received By FEDEX 9-22-99 1400	
Relinquished By FedEx 9-23-99 0945	Received By CT 9-22-99 TMurray 9-23-99 0945	

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L166
SDG/SAF #: H0541/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 09-23-99

SEMIVOLATILE

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were extracted on 10-04-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Methods 8270B for TCL Semivolatile target compounds on 10-05-99.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding times for extraction and analysis were met.
3. Non-target compounds were detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.
7. The sample was spectrally searched for Butylated Hydroxytoluene; however, it was not identified in the sample.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-11-99
Date

som\gorup\data\bna\tnu09166.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 10/31/99 16:02

RFW Batch Number: **9909L166** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1a

	Cust ID:	B0WBT3		B0WBT3		B0WBT3		SBLKDQ		SBLKDQ BS	
Sample Information	RFW#:	001		001 MS		001 MSD		99LE1196-MB1		99LE1196-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Nitrobenzene-d5	60	%	80	%	75	%	78	%	92	%
	2-Fluorobiphenyl	58	%	78	%	73	%	78	%	94	%
	Terphenyl-d14	71	%	92	%	85	%	92	%	104	%
	Phenol-d5	61	%	78	%	75	%	81	%	94	%
	2-Fluorophenol	60	%	77	%	73	%	77	%	92	%
	2,4,6-Tribromophenol	62	%	87	%	79	%	75	%	96	%
Phenol		350	U	73	%	72	%	330	U	90	%
bis(2-Chloroethyl)ether		350	U	350	U	350	U	330	U	330	U
2-Chlorophenol		350	U	73	%	72	%	330	U	90	%
1,3-Dichlorobenzene		350	U	350	U	350	U	330	U	330	U
1,4-Dichlorobenzene		350	U	69	%	72	%	330	U	89	%
1,2-Dichlorobenzene		350	U	350	U	350	U	330	U	330	U
2-Methylphenol		350	U	350	U	350	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		350	U	350	U	350	U	330	U	330	U
4-Methylphenol		350	U	350	U	350	U	330	U	330	U
N-Nitroso-di-n-propylamine		350	U	82	%	82	%	330	U	99	%
Hexachloroethane		350	U	350	U	350	U	330	U	330	U
Nitrobenzene		350	U	350	U	350	U	330	U	330	U
Isophorone		350	U	350	U	350	U	330	U	330	U
2-Nitrophenol		350	U	350	U	350	U	330	U	330	U
2,4-Dimethylphenol		350	U	350	U	350	U	330	U	330	U
bis(2-Chloroethoxy)methane		350	U	350	U	350	U	330	U	330	U
2,4-Dichlorophenol		350	U	350	U	350	U	330	U	330	U
1,2,4-Trichlorobenzene		350	U	76	%	76	%	330	U	93	%
Naphthalene		350	U	350	U	350	U	330	U	330	U
4-Chloroaniline		350	U	350	U	350	U	330	U	330	U
Hexachlorobutadiene		350	U	350	U	350	U	330	U	330	U
4-Chloro-3-methylphenol		350	U	80	%	76	%	330	U	92	%
2-Methylnaphthalene		350	U	350	U	350	U	330	U	330	U
Hexachlorocyclopentadiene		350	U	350	U	350	U	330	U	330	U
2,4,6-Trichlorophenol		350	U	350	U	350	U	330	U	330	U
2,4,5-Trichlorophenol		880	U	880	U	880	U	840	U	840	U

*= Outside of EPA CLP QC limits.

Cust ID:	B0WBT3	B0WBT3	B0WBT3	SBLKDQ	SBLKDQ BS
RFW#:	001	001 MS	001 MSD	99LE1196-MB1	99LE1196-MB1
2-Chloronaphthalene	350 U	350 U	350 U	330 U	330 U
2-Nitroaniline	880 U	880 U	880 U	840 U	840 U
Dimethylphthalate	350 U	350 U	350 U	330 U	330 U
Acenaphthylene	350 U	350 U	350 U	330 U	330 U
2,6-Dinitrotoluene	350 U	350 U	350 U	330 U	330 U
3-Nitroaniline	880 U	880 U	880 U	840 U	840 U
Acenaphthene	350 U	81 %	78 %	330 U	97 %
2,4-Dinitrophenol	880 U	880 U	880 U	840 U	840 U
4-Nitrophenol	880 U	82 %	74 %	840 U	87 %
Dibenzofuran	350 U	350 U	350 U	330 U	330 U
2,4-Dinitrotoluene	350 U	85 %	80 %	330 U	98 * %
Diethylphthalate	350 U	350 U	350 U	330 U	330 U
4-Chlorophenyl-phenylether	350 U	350 U	350 U	330 U	330 U
Fluorene	350 U	350 U	350 U	330 U	330 U
4-Nitroaniline	880 U	880 U	880 U	840 U	840 U
4,6-Dinitro-2-methylphenol	880 U	880 U	880 U	840 U	840 U
N-Nitrosodiphenylamine (1)	350 U	350 U	350 U	330 U	330 U
4-Bromophenyl-phenylether	350 U	350 U	350 U	330 U	330 U
Hexachlorobenzene	350 U	350 U	350 U	330 U	330 U
Pentachlorophenol	880 U	89 %	76 %	840 U	94 %
Phenanthrene	350 U	350 U	350 U	330 U	330 U
Anthracene	350 U	350 U	350 U	330 U	330 U
Carbazole	350 U	350 U	350 U	330 U	330 U
Di-n-butylphthalate	350 U	350 U	350 U	330 U	330 U
Fluoranthene	350 U	350 U	350 U	330 U	330 U
Pyrene	350 U	90 %	87 %	330 U	104 %
Butylbenzylphthalate	350 U	350 U	350 U	330 U	330 U
3,3'-Dichlorobenzidine	350 U	350 U	350 U	330 U	330 U
Benzo(a)anthracene	350 U	350 U	350 U	330 U	330 U
Chrysene	350 U	350 U	350 U	330 U	330 U
bis(2-Ethylhexyl)phthalate	350 U	350 U	350 U	330 U	330 U
Di-n-octyl phthalate	350 U	350 U	350 U	330 U	330 U
Benzo(b)fluoranthene	350 U	350 U	350 U	330 U	330 U
Benzo(k)fluoranthene	350 U	350 U	350 U	330 U	330 U
Benzo(a)pyrene	350 U	350 U	350 U	330 U	330 U
Indeno(1,2,3-cd)pyrene	350 U	350 U	350 U	330 U	330 U
Dibenz(a,h)anthracene	350 U	350 U	350 U	330 U	330 U
Benzo(g,h,i)perylene	350 U	350 U	350 U	330 U	330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WBT3

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L166-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D100507

Level: (low/med) LOW Date Received: 09/23/99

% Moisture: 5 decanted: (Y/N) Date Extracted: 10/04/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/05/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.48	90	JB
2.	ALDOL CONDENSATE	9.02	70	JA

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKDQ

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 99LE1196-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D100505

Level: (low/med) LOW Date Received: 10/04/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 10/04/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/05/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.48	80	J

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WBT3	001	S	99LE1196	09/21/99	10/04/99	10/05/99
B0WBT3	001 MS	S	99LE1196	09/21/99	10/04/99	10/05/99
B0WBT3	001 MSD	S	99LE1196	09/21/99	10/04/99	10/05/99
LAB QC:						
SBLKDQ	MB1	S	99LE1196	N/A	10/04/99	10/05/99
SBLKDQ	MB1 BS	S	99LE1196	N/A	10/04/99	10/05/99

RECRA LabNet Use Only: 9909L166

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 9-23-99 Date Due: 10/23/99
Account #:

Refrigerator #		1	6											
#/Type Container	Liquid													
	Solid	1AG	1AG					1AG						
Volume	Liquid													
	Solid	100mL	250mL					500mL						
Preservatives		–	–					–						
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb			INORG: Metal	CN					

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OC024H OESCSC	OC025H OPRO	OPCB			ICRG	Met(1)	ICNTO ICN3N2	ICNH3N ISFD	IPH ICOL	ICFL ICSO4 ICPO4 ICNO3 ICNO2
001	BOWBT3	X	X	S	9-21-99	1250	✓	✓	X			X	✓	X	X	X	X

Special Instructions:

COMPOSITE WASTE

Saf# B99-078

DATE/REVISIONS:
1. Met(1) = Recra + Be, Cu, Ni, V, Zn
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 5.5 °C

Relinquished by	Received by	Date	Time
Fed Ex	T Murray	9-23-99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-122	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code	Data Turnaround
Bowers/Trice	Chris Cearlock 372-9574	TRENT, SJ	8N	45 Days
Project Designation	**Sampling Location**	**SAF No.**		
200 Area Source characterization - 200-CW-1 OU	200 B pond (B8758) >15'	B99-078		
Ice Chest No.	**Field Logbook No.**	**Method of Shipment**		
ERC 96-068	EL-1511	Fed Ex		
Shipped To	**Offsite Property No.**	**Bill of Lading/Air Bill No.**		
~~TMA/RECRA~~ DTB 9-21-99 RECRA	A9902666	4235 7952 9660		
		COA B20CW1 67C		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
Special Handling and/or Storage	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time									
B0WBT2	Soil											
B0WBT3	Soil	9-21-99	1250	X	X		X			Dam/CAL		
B0WBT4	Soil											
B0WBT5	Soil											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By / Date/Time	Doug Bowers 9-21-99/1630	Received By / Date/Time	B of B 9-21-99/1630
Relinquished By / Date/Time	Reb 1B 9-22-99 1100	Received By / Date/Time	C Trice 9/22/99 1100
Relinquished By / Date/Time	C Trice 9-22-99 1400	Received By / Date/Time	FEDEX 9-22-99 1400
Relinquished By / Date/Time	FedEx 9-23-99 0945	Received By / Date/Time / Title	CT 9-22-99 TMurray 9-23-99 0945

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078. *Out of Gamma Spec.* bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, *Total Cyanide*, and pH.

(1) Gamma Spectroscopy {*Cesium*-137, Cobalt-60, Europium-152, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; *Isotopic Plutonium*; Isotopic Thorium {Thorium-232}; Americium-241
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By / Date/Time

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L166
SDG/SAF#: H0541/B99-078

W.O #: 10985-001-001-9999-00
Date Received: 09-22-99

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were prepared on 10-04-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 10-08-99. The analysis met the intent of method WTPH-D.

1. The cooler temperature has been recorded on the chain-of-custody.

2. All required holding times for extraction and analysis were met.

3. All initial calibrations associated with this data set were within acceptance criteria.

4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. All surrogate recoveries were within acceptance criteria.

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-19-99
Date

R:\SHARE\LC\GCSCAN\09-166d.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF DIESEL DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet - Lionville Laboratory

DIESEL RANGE ORGANICS BY GC

Report Date: 10/13/99 07:11

RFW Batch Number: **9909L166** Client: **TNU-HANFORD B99-078** Work Order: **10985-001-001-9999-00**

003

	Cust ID:	B0WBT3	B0WBT3	B0WBT3	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LE1192-MB1	99LE1192-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate:	p-Terphenyl	62 %	107 %	106 %	96 %	98 %
Diesel Range Organics		4.1 U	95 %	86 %	4.0 U	84 %

10/13/99

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Recra LabNet - Lionville Laboratory
DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WBT3	001	S	99LE1192	09/21/99	10/04/99	10/08/99
B0WBT3	001 MS	S	99LE1192	09/21/99	10/04/99	10/08/99
B0WBT3	001 MSD	S	99LE1192	09/21/99	10/04/99	10/08/99
LAB QC:						
BLK	MB1	S	99LE1192	N/A	10/04/99	10/08/99
BLK	MB1 BS	S	99LE1192	N/A	10/04/99	10/08/99

RECRA LabNet Use Only
9909L166

Custody Transfer Record/Lab Work Request

RECRA LabNet

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TRU Hanford B99-078

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 9-23-99 Date Due: 10/23/99

Account #:

	VOA	BNA	Pest/PCB	Herb			Metal	CN				
Refrigerator #	1	6 —									—	
#/Type Container Liquid												
#/Type Container Solid	1AG	1AG	⊣			⊢	1AG				⊣	
Volume Liquid												
Volume Solid	60mL	250mL	⊣			⊢	500mL				⊣	
Preservatives	–	–					–					

ANALYSES REQUESTED: ORGANIC (VOA, BNA, Pest/PCB, Herb); INORG (Metal, CN)

RECRA LabNet Use Only

MATRIX CODES:
- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- L - EP/TCLP Leachate
- WI - Wipe
- X - Other
- F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	OO24H OECSC	OO25H OPRO	OPCB				ICRG	Met 1	ICNTO ICN3N2	INH3N ISFD	IPH ICOL	ICFL ICSO4 ICPO4 ICNO3 ICNO2		
001	BOWBT3	X	X	S	9-21-99	1250	✓	✓	X				X	✓	X	X	X	X		

Special Instructions:

COMPOSITE WASTE

Saf # B99-078

DATE/REVISIONS:
1. Met 1 = Recra + Be, Cu, Ni, V, Zn
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 5.5 °C

Relinquished by	Received by	Date	Time
Fed Ex	T Murray	9-23-99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B99-078-122	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		
Ice Chest No. ERC 96-068		Field Logbook No. EL-1511		Method of Shipment Fed Ex		
Shipped To ~~TMA/RECRA~~ DTO 9-21-99 RECRA		Offsite Property No. A9902666		Bill of Lading/Air Bill No. 4235 1952 9661 4		
				COA B20CW167C		

POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
B0WBT2	Soil										
B0WBT3	Soil	9-21-99	1250	X	X		X			DomCal	
B0WBT4 DTO 9-21-99	Soil										
B0WBT5 9-21-99	Soil										

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	Doug Bowers	9-21-99/1630
Received By	RaF 10	9-21-99/1630
Relinquished By	Ref 10	9-22-99 1100
Received By	C Price	9/22/99 1100
Relinquished By	C Price	9-22-99 1400
Received By	FEDEX	9-22-99 1400
Relinquished By	FedEx	9-23-99 0945
Received By	CT 9-22-99 TMurray	9-23-99 0945

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 – Total Sr, Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-078
RFW#: 9909L166
SDG/SAF#: H0541/B99-078

W.O.#: 10985-001-001-9999-00
Date Received: 09-23-99

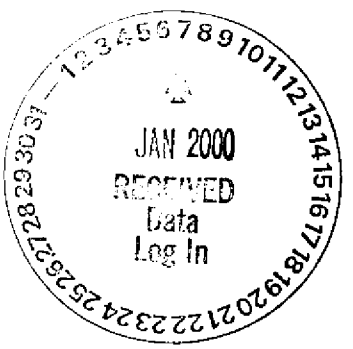
PCB

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were extracted on 10-05-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 10-08-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The sample and its associated QC samples received a sulfuric acid and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.



by J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-22-99
Date

pef\r:\group\data\pest\09L-166.pcb

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 10/12/99 09:50

RFW Batch Number: **9909L166** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1

004

	Cust ID:	B0WBT3	B0WBT3	B0WBT3	PBLKVY	PBLKVY BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LE1200-MB1	99LE1200-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	102 %	110 %	108 %	100 %	110 %
	Decachlorobiphenyl	99 %	108 %	104 %	96 %	102 %
		fl	fl	fl	fl	fl fl
Aroclor-1016		35 U	34 U	35 U	33 U	33 U
Aroclor-1221		70 U	69 U	70 U	67 U	67 U
Aroclor-1232		35 U	34 U	35 U	33 U	33 U
Aroclor-1242		35 U	34 U	35 U	33 U	33 U
Aroclor-1248		35 U	34 U	35 U	33 U	33 U
Aroclor-1254		35 U	89 %	88 %	33 U	84 %
Aroclor-1260		35 U	34 U	35 U	33 U	33 U

10-20-99

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WBT3	001	S	99LE1200	09/21/99	10/05/99	10/08/99
B0WBT3	001 MS	S	99LE1200	09/21/99	10/05/99	10/08/99
B0WBT3	001 MSD	S	99LE1200	09/21/99	10/05/99	10/08/99
LAB QC:						
PBLKVY	MB1	S	99LE1200	N/A	10/05/99	10/08/99
PBLKVY	MB1 BS	S	99LE1200	N/A	10/05/99	10/08/99

gw 10-20-99

RECRA LabNet Use Only
9909L166

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: Thu Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 9-23-99 Date Due: 10/23/99
Account #:

		VOA	BNA	Pest/PCB	Herb				Metal	CN						
Refrigerator #		1	6 —									—				
#/Type Container	Liquid															
	Solid	1AG	1AG —					—	1AG —			—				
Volume	Liquid															
	Solid	60mL	250mL —					—	500mL —			—				
Preservatives		-	-						-							
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN						

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OV024H OV025C	OV025H ODRO	OPCB				ICRG	Met(1)	ICNTO IN3N2	INH3N ISFD	IPH ICCL	ICFL ICSO4 ICPO4 ICNO3 ICNO2			
001	BOWBT3	X	X	S	9-21-99	1250	✓	✓	X				X	✓	X	X	X	X			

(Analysis codes above are under "RECRA LabNet Use Only".)

Special Instructions:

COMPOSITE WASTE

Saf # B99-078

DATE/REVISIONS:
1. Met(1) = Recra + Be, Cu, Ni, V, Zn
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	TMurray	9-23-99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 5.5 °C

006

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B99-078-122	Page 1 of 1
Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		
Ice Chest No. ERC 96-068	Field Logbook No. EL-1511		Method of Shipment Fed Ex		
Shipped To ~~TMA/RECRA~~ DTB 9-21-99 RECRA	Offsite Property No. A990266		Bill of Lading/Air Bill No. 4235 1952 9660-4		
			COA B20CW1 67/C		

POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s) Volume	1 60mL	1 250mL	1 250mL	1 500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
B0WBT2 ~~D~~ 9-21-99	Soil										
B0WBT3	Soil	9-21-99	1250	X	X		X			DUP CA1	
B0WBT4 ~~9-21-99~~	Soil										
B0WBT5 9-21-99	Soil										

CHAIN OF POSSESSION	Sign/Print Names		
	Relinquished By	Received By	Date/Time
1	Doug Bowers 9-21-99/1630	B of I D 9-21-99/1630	
2	Relinquished By: B of I D 9-22-99 1100	Received By: C Trice 9/22/99 1100	
3	Relinquished By: C Trice 9-22-99 1400	Received By: FEDEX 9-22-99 1400	
4	Relinquished By: FedEx 9-23-99 0945	Received By: CT 9-22-99 / TMurray 9-23-99 0945	

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, *Total Cyanide*, and pH.

(1) Gamma Spectroscopy {*Cesium*-137, Cobalt-60, Europium-152, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241
(2) ICP Metals - 6010A (Supertrace) {Arsenic, *Barium*, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; *Mercury* - 7471 - (CV); Chromium Hex - 7196

COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD B99-078
RFW #: 9909L166
SDG/SAF#: H0541/B99-078

W.O. #: #: 10985-001-001-9999-00
Date Received: 09-23-99

GC SCAN

One (1) soil samples was collected on 09-21-99.

The sample and its associated QC samples were prepared on 09-24-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and Butanol on 09-27-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The sample was packaged and stored as specified in the method protocol; the cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The required holding time for analysis was met.

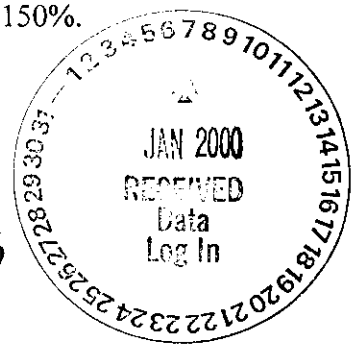
3. All initial calibrations associated with this data set were within acceptance criteria.

4. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. Surrogates were not used for this analysis.

6. The blank spike recovery was within advisory control limits of 50%-150%.

7. All matrix spike recoveries were within the advisory control limits of 50%-150%.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-15-99
Date

r:\share\lc\gcscan\09-166.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

003

	Cust ID:	B0WBT3	B0WBT3	B0WBT3	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LLC144-MB1	99LLC144-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
n-Propyl Alcohol		4.8 U	91 %	108 %	5.0 U	87 %
Ethanol		4.8 U	5.0 U	5.0 U	5.0 U	5.0 U

10/4/99

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Recra LabNet - Lionville Laboratory
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WBT3	001	S	99LLC144	09/21/99	09/24/99	09/27/99
B0WBT3	001 MS	S	99LLC144	09/21/99	09/24/99	09/27/99
B0WBT3	001 MSD	S	99LLC144	09/21/99	09/24/99	09/27/99
LAB QC:						
BLK	MB1	S	99LLC144	N/A	09/24/99	09/27/99
BLK	MB1 BS	S	99LLC144	N/A	09/24/99	09/27/99

RECRA LabNet Use Only: 9909L166

Custody Transfer Record/Lab Work Request

Page 1 of 1

All

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: CJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 9-23-99 Date Due: 10/23/99
Account #:

Refrigerator #		1	6								
#/Type Container	Liquid										
	Solid	1 AG	1 AG				1 AG				
Volume	Liquid										
	Solid	60 mL	250 mL				500 mL				
Preservatives		-	-				-				
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb		INORG: Metal	CN			

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	OC24H OC5C	OC25H ODRO	OPCB	ICRG	Met(1)	ICNTO ICN3N2	ICNH3N ISFD	IPH ICCL	ICFL ICSO4 ICPO4 ICNO3 ICNO2
001	BOWBT3	X	X	S	9-21-99	1250	✓	✓	X	X	✓	X	X	X	X

Special Instructions:

COMPOSITE WASTE

Saf # B99-078

DATE/REVISIONS:
1. Met(1) = Recra + Be, Cu, Ni, V, Zn
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 5.5 °C

Relinquished by	Received by	Date	Time
Fed Ex	TMurray	9-23-99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-122	Page 1 of 1

Collector Bowers/Trice	**Company Contact** Chris Cearlock **Telephone No.** 372-9574	**Project Coordinator** TRENT, SJ	**Price Code** 8N **Data Turnaround** 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU	**Sampling Location** 200 B pond (B8758) >15'	**SAF No.** B99-078	
Ice Chest No. ERC 96-068	**Field Logbook No.** EL-1511	**Method of Shipment** Fed Ex	
Shipped To ~~TMA/RECRA~~ DOE 9-21-99 RECRA	**Offsite Property No.** A990266	**Bill of Lading/Air Bill No.** 4235 1952 9660 4	
		COA B20CW1 67/C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	None	Cool 4C								
Type of Container	aG	aG	aG	aG								
No. of Container(s)	1	1	1	1								
Volume	60mL	250mL	250mL	500mL								
SAMPLE ANALYSIS	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.								
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**									
B0WBT2	Soil											
B0WBT3	Soil	9-21-99	1250	X	X		X			DamCAL		
B0WBT4	Soil											
B0WBT5	Soil											

CHAIN OF POSSESSION

Sign/Print Names	Date/Time
Relinquished By Doug Bowers / Doug Bowers	9-21-99/1630
Received By B of D	9-21-99/1630
Relinquished By Reb D	9.22.99 1100
Received By Chris	9/22/99 1100
Relinquished By Chris	9.22.99 1400
Received By ~~Chris~~ FEDEX	9.22.99 1400
Relinquished By FedEx	9.23.99 0945
Received By CT 9-22-99 / JMurray (Title)	9.23.99 0945

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By / Date/Time

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L166
SDG# : H0541
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 09-23-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Total Cyanide and Sulfide analyses.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blanks were within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits. The matrix spike duplicates were within the 20% RPD control limit.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-4-00
Date

njp\i09-166

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Soilids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		✓ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygne Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3	
Sulfide		✓ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Prpearation Leach		__ 1312	
Paint Filter		9095A	

Other: Nitrate Nitrite **Method:** EPA 353.2

Other: Ammonia **Method** EPA 350.3

Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate } EPA 300.0

Recra LabNet Philadelphia

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0WBT3	% Solids	95.3	%	0.01	1.0
		Chloride by IC	2.5	MG/KG	1.3	1.0
		Fluoride by IC	2.6 u	MG/KG	2.6	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	1.3 u	MG/KG	1.3	1.0
		Cyanide, Total	0.52 u	MG/KG	0.52	1.0
		Phosphate by IC	1.3 u	MG/KG	1.3	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	72.2	MG/KG	5.2	4.0
		Nitrate Nitrite	0.24	MG/KG	0.20	1.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		pH	8.7	SOIL PH	0.01	1.0
		Sulfide	1.0 u	MG/KG	1.0	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC083-MB1	Chloride by IC	1.2 u	MG/KG	1.2	1.0
		Fluoride by IC	2.5 u	MG/KG	2.5	1.0
		Nitrite by IC	1.2 u	MG/KG	1.2	1.0
		Nitrate by IC	1.2 u	MG/KG	1.2	1.0
		Phosphate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	99LC112A-MB1	Cyanide, Total	0.50 u	MG/KG	0.50	1.0
BLANK10	99LVI068-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	99LICA83-MB1	Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	99LN3D47-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	99LAM038-MB1	Ammonia, as N	1.2 u	MG/KG	1.2	1.0
BLANK10	99LAM050-MB1	Ammonia, as N	1.2 u	MG/KG	1.2	1.0
BLANK10	99LSD051-MB1	Sulfide	1.0 u	MG/KG	1.0	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0WBT3	Chloride by IC	28.5	2.5	26.2	98.8	1.0
		Chloride by IC MSD	28.5	2.5	26.2	98.9	1.0
		Fluoride by IC	60.0	1.2	52.5	112.0	1.0
		Fluoride by IC MSD	58.6	1.2	52.5	109.4	1.0
		Nitrite by IC	28	1.3 u	26	105.0	1.0
		Nitrite by IC MSD	27	1.3 u	26	102.3	1.0
		Nitrate by IC	27	1.3 u	26	103.0	1.0
		Nitrate by IC MSD	27	1.3 u	26	101.7	1.0
		Cyanide, Total	5.1	0.52u	5.2	96.9	1.0
		Cyanide, Total MSD	5.3	0.52u	5.2	100.9	1.0
		Phosphate by IC	27.1	1.3 u	26.2	103.3	1.0
		Phosphate by IC MSD	27.0	1.3 u	26.2	102.8	1.0
		Soluble Chromium VI	4.0	0.42u	4.2	95.5	1.0
		Insoluble Chromium VI	1220	0.42u	1180	103.8	100
		Sulfate by IC	184	72.2	105	106.9	4.0
		Sulfate by IC MSD	184	72.2	105	106.6	4.0
		Nitrate Nitrite	5.6	0.24	5.2	102.9	1.0
		Nitrate Nitrite MSD	5.6	0.24	5.2	101.9	1.0
		Ammonia, as N	105	1.3 u	104	100.6	1.0
		Sulfide	345	0.0	379	91.1	1.0
		Sulfide MSD	377	0.0	408	92.4	1.0
BLANK10	99LIC083-MB1	Chloride by IC	23.6	1.2 u	25.0	94.5	1.0
		Fluoride by IC	52.4	2.5 u	50.0	104.8	1.0
		Nitrite by IC	24	1.2 u	25	97.8	1.0
		Nitrate by IC	24	1.2 u	25	95.8	1.0
		Phosphate by IC	25.1	1.2 u	25.0	100.5	1.0
BLANK10	99LVI068-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.9	1.0
		Insoluble Chromium VI	1180	0.40u	1160	101.3	100
BLANK10	99LIC083-MB1	Sulfate by IC	23.5	1.2 u	25.0	93.9	1.0
BLANK10	99LN3D47-MB1	Nitrate Nitrite	5.0	0.20u	5.0	101.0	1.0
		Nitrate Nitrite MSD	5.1	0.20u	5.0	102.6	1.0
BLANK10	99LAM038-MB1	Ammonia, as N	48.6	1.2 u	50.0	97.2	1.0
		Ammonia, as N MSD	51.0	1.2 u	50.0	102.0	1.0
BLANK10	99LAM050-MB1	Ammonia, as N	49.5	1.2 u	50.0	99.0	1.0
		Ammonia, as N MSD	50.2	1.2 u	50.0	100.5	1.0
BLANK10	99LSD051-MB1	Sulfide	9.4	1.0 u	10.0	94.0	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-001	B0WBT3	Chloride by IC	98.8	98.9	0.058
		Fluoride by IC	112.0	109.4	2.3
		Nitrite by IC	105.0	102.3	2.6
		Nitrate by IC	103.0	101.7	1.3
		Cyanide, Total	96.9	100.9	4.0
		Phosphate by IC	103.3	102.8	0.54
		Sulfate by IC	106.9	106.6	0.24
		Nitrate Nitrite	102.9	101.9	0.93
		Sulfide	91.1	92.4	1.3
BLANK10	99LN3D47-MB1	Nitrate Nitrite	101.0	102.6	1.6
BLANK10	99LAM038-MB1	Ammonia, as N	97.2	102.0	4.8
BLANK10	99LAM050-MB1	Ammonia, as N	99.0	100.5	1.5

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0WBT3	% Solids	95.3	93.5	1.9	1.0
		Chloride by IC	2.5	2.7	6.0	1.0
		Fluoride by IC	2.6 u	2.6 u	NC	1.0
		Nitrite by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	1.3 u	1.3 u	NC	1.0
		Cyanide, Total	0.52u	0.52u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	0.42u	0.42u	NC	1.0
		Sulfate by IC	72.2	72.3	0.16	4.0
		Nitrate Nitrite	0.24	0.27	9.0	1.0
		Ammonia, as N	1.3 u	1.3 u	NC	1.0
		pH	8.7	8.8	0.7	1.0
		Sulfide	1.0 u	3.6	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS10	99LC112A-LC1	Cyanide, Total LCS	1.8	2.0	MG/KG	92.2
LCS20	99LC112A-LC2	Cyanide, Total LCS	9.6	10	MG/KG	96.5

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WBT3						
% SOLIDS	001	S	99L%S128	09/21/99	10/01/99	10/03/99
% SOLIDS	001 REP	S	99L%S128	09/21/99	10/01/99	10/03/99
CHLORIDE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
CHLORIDE BY IC	001 REP	S	99LIC083	09/21/99	10/04/99	10/04/99
CHLORIDE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
CHLORIDE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC	001 REP	S	99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC	001 REP	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRATE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRATE BY IC	001 REP	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRATE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRATE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
TOTAL CYANIDE	001	S	99LC112A	09/21/99	10/06/99	10/06/99
TOTAL CYANIDE	001 REP	S	99LC112A	09/21/99	10/06/99	10/06/99
TOTAL CYANIDE	001 MS	S	99LC112A	09/21/99	10/06/99	10/06/99
TOTAL CYANIDE	001 MSD	S	99LC112A	09/21/99	10/06/99	10/06/99
PHOSPHATE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
PHOSPHATE BY IC	001 REP	S	99LIC083	09/21/99	10/04/99	10/04/99
PHOSPHATE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
PHOSPHATE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
CHROMIUM VI	001	S	99LVI068	09/21/99	10/05/99	10/05/99
CHROMIUM VI	001 REP	S	99LVI068	09/21/99	10/05/99	10/05/99
CHROMIUM VI	001 MS	S	99LVI068	09/21/99	10/05/99	10/05/99
CHROMIUM VI	001 MSD	S	99LVI068	09/21/99	10/05/99	10/05/99
SULFATE BY IC	001	S	99LICA83	09/21/99	10/04/99	10/04/99
SULFATE BY IC	001 REP	S	99LICA83	09/21/99	10/04/99	10/04/99
SULFATE BY IC	001 MS	S	99LICA83	09/21/99	10/04/99	10/04/99
SULFATE BY IC	001 MSD	S	99LICA83	09/21/99	10/04/99	10/04/99
NITRATE NITRITE	001	S	99LN3D47	09/21/99	09/30/99	10/01/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRATE NITRITE	001 REP	S	99LN3D47	09/21/99	09/30/99	10/01/99
NITRATE NITRITE	001 MS	S	99LN3D47	09/21/99	09/30/99	10/01/99
NITRATE NITRITE	001 MSD	S	99LN3D47	09/21/99	09/30/99	10/01/99
AMMONIA	001	S	99LAM038	09/21/99	10/12/99	10/12/99
AMMONIA	001 REP	S	99LAM050	09/21/99	12/28/99	12/29/99
AMMONIA	001 MS	S	99LAM050	09/21/99	12/28/99	12/29/99
PH	001	S	99LPH105	09/21/99	10/01/99	10/01/99
PH	001 REP	S	99LPH105	09/21/99	10/01/99	10/01/99
SULFIDE	001	S	99LSD051	09/21/99	09/29/99	09/30/99
SULFIDE	001 REP	S	99LSD051	09/21/99	09/29/99	09/30/99
SULFIDE	001 MS	S	99LSD051	09/21/99	09/29/99	09/30/99
SULFIDE	001 MSD	S	99LSD051	09/21/99	09/29/99	09/30/99

LAB QC:

CHLORIDE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
CHLORIDE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
FLUORIDE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
FLUORIDE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
NITRITE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
NITRITE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
NITRATE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
NITRATE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
TOTAL CYANIDE	LC1 L	S	99LC112A	N/A	10/06/99	10/06/99
TOTAL CYANIDE	LC2 L	S	99LC112A	N/A	10/06/99	10/06/99
TOTAL CYANIDE	MB1	S	99LC112A	N/A	10/06/99	10/06/99
PHOSPHATE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
PHOSPHATE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
CHROMIUM VI	MB1	S	99LVI068	N/A	10/05/99	10/05/99
CHROMIUM VI	MB1 BS	S	99LVI068	N/A	10/05/99	10/05/99
CHROMIUM VI	MB1 BSD	S	99LVI068	N/A	10/05/99	10/05/99
SULFATE BY IC	MB1	S	99LICA83	N/A	10/04/99	10/04/99
SULFATE BY IC	MB1 BS	S	99LICA83	N/A	10/04/99	10/04/99
NITRATE NITRITE	MB1	S	99LN3D47	N/A	09/30/99	10/01/99
NITRATE NITRITE	MB1 BS	S	99LN3D47	N/A	09/30/99	10/01/99
NITRATE NITRITE	MB1 BSD	S	99LN3D47	N/A	09/30/99	10/01/99
AMMONIA	MB1	S	99LAM038	N/A	10/12/99	10/12/99
AMMONIA	MB1 BS	S	99LAM038	N/A	10/12/99	10/12/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AMMONIA	MB1 BSD	S	99LAM038	N/A	10/12/99	10/12/99
AMMONIA	MB1	S	99LAM050	N/A	12/28/99	12/29/99
AMMONIA	MB1 BS	S	99LAM050	N/A	12/28/99	12/29/99
AMMONIA	MB1 BSD	S	99LAM050	N/A	12/28/99	12/29/99
SULFIDE	MB1	S	99LSD051	N/A	09/29/99	09/30/99
SULFIDE	MB1 BS	S	99LSD051	N/A	09/29/99	09/30/99

RECRA LabNet Use Only: 9909L166

Custody Transfer Record/Lab Work Request

Page 1 of 1

All

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client Thu Hanford B99-078

Est. Final Proj. Sampling Date

Project # 10985-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager OJ

QC Spec **Del** Std **TAT** 30 day

Date Rec'd 9-23-99 **Date Due** 10/23/99

Account #

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Refrigerator #		1	6 ———	———	———	———	———	———	———	———	———	———	———|			
#/Type Container	Liquid															
	Solid	1AG	1AG ——|					|——	1AG ———	———	———	———	———|			
Volume	Liquid															
	Solid	100mL	250mL ——|					|——	500mL ———	———	———	———	———|			
Preservatives		–	–						–							
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN						
RECRA LabNet Use Only		OC024H OECSC	OC025H OPRC	OPCB	↓			ICRG	Met(1)	ICNTO IN3N2	INH3N ISFD	IPH ICCL	↓ ICFL ICSO4 ICPO4 ICNO3 ICNO2			

MATRIX CODES:
- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- L - EP/TCLP Leachate
- WI - Wipe
- X - Other
- F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
001	BOWBT3	X	X	S	9-21-99	1250	✓	✓	X				X	✓	X	X	X	X			

Special Instructions:

COMPOSITE WASTE

Saf# B99-078

DATE/REVISIONS:

1. Met(1) = Recra + Be, Cu, Ni, V, Zn
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 5.5 °C

Relinquished by	Received by	Date	Time
Fed Ex	TMurray	9-23-99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-122	Page 1 of 1

Collector Bowers/Trice	Company Contact / Telephone No. Chris Cearlock 372-9574	Project Coordinator TRENT, SJ	Price Code 8N / Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'	SAF No. B99-078	
Ice Chest No. ERC 96-068	Field Logbook No. EL-1511	Method of Shipment Fed Ex	
Shipped To<br~~TMA/RFCRA~~ DOE 9-21-99 RECRA	Offsite Property No. A 990266	Bill of Lading/Air Bill No. 4235 7952 96604	
		COA B20CW1 6 7/C	

POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s) Volume	1 60mL	1 250mL	1 250mL	1 500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
B0WBT2 ~~9-21-99~~	Soil										
B0WBT3	Soil	9-21-99	1250	X	X		X			DomCal	
B0WBT4 ~~9-21-99~~	Soil										
B0WBT5 9-21-99	Soil										

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	Doug Bowers	9-21-99/1630
Received By	R of D	9-21-99/1630
Relinquished By	Rcf D	9.22.99 1100
Received By	Chice	9/22/99 1100
Relinquished By	Chice	9.22.99 1400
Received By	~~Chice~~ FEDEX	9.22.99 1400
Relinquished By	FedEx	9.23.99 0945
Received By	CT 9-22-99 / TMurray	9.23.99 0945

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

14

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0541 is composed of one solid (soil) sample designated under SAF No. B99-078 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. Results were transmitted to BHI via facsimile on November 15, 1999.

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses. A recount was performed on the QC blank.

2.3 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.4 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses. A recount was performed on the duplicate. The RPD in the duplicate result and the original was 73%, greater than the allowable 3 sigma total of 68%. Both the original and duplicate results were less than the RDL.

2.7 Technetium-99 Analyses

No problems were encountered during the course of the analyses. Technetium-99 activity greater than the sample MDA but less than the RDL was detected in the QC blank.

2.8 Total and Isotopic Uranium Analyses

Isotopic Uranium was to be ordered by BHI after reviewing data from the Total Uranium testing. No Isotopic Uranium analysis was requested. No problems were encountered during the course of the analyses.

2.9 Tritium Analyses

No problems were encountered during the course of the analyses.

2.10 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

SAMPLE SUMMARY

SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0WBT3	200 B pond (B8758) >15'	SOLID		N909164-01	B99-078	B99-078-122	09/21/99 12:50
Method Blank		SOLID		N909137-04	B99-078		
Lab Control Sample		SOLID		N909137-03	B99-078		
Duplicate (N909164-01)	200 B pond (B8758) >15'	SOLID		N909164-04	B99-078		09/21/99 12:50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

QC SUMMARY

SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7214		Method Blank	SOLID						N909137-04	7214-004
		Lab Control Sample	SOLID						N909137-03	7214-003
7217	B99-078-122	B0WBT3	SOLID	93.1			09/23/99	2	N909164-01	7217-001
		Duplicate (N909164-01)	SOLID	93.1			09/23/99	2	N909164-04	7217-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

PREP BATCH SUMMARY

SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6904-018	5.0	1			1	1	1/1		
NP	SOLID	Neptunium in Soil	6904-018	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6904-018	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6904-018	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6904-018	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6904-018	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6904-018	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	6904-018	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	6904-018	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Soil	6904-018	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

WORK SUMMARY

SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUFFIX	ANALYZED	REVIEWED	BY	METHOD
B0WBT3			N909164-01	7217-001	AM		11/10/99	11/15/99	NJV	Americium 241 in Soil
200 B pond (B8758) >15'		SOLID	09/21/99	7217-001	GAM		11/03/99	11/15/99	NJV	Gamma Scan
B99-078-122	B99-078		09/23/99	7217-001	H		10/27/99	11/15/99	NJV	Tritium in Soil
				7217-001	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil
				7217-001	NP		11/06/99	11/15/99	NJV	Neptunium in Soil
				7217-001	PU		11/10/99	11/15/99	NJV	Plutonium, Isotopic in Solids
				7217-001	SR		11/06/99	11/15/99	NJV	Total Strontium in Soil
				7217-001	TC		10/25/99	11/15/99	NJV	Technetium 99 in Soil
				7217-001	TH		11/02/99	11/15/99	NJV	Thorium, Isotopic in Soil
				7217-001	U_T		10/20/99	11/15/99	NJV	Uranium, Total in Soil
Method Blank			N909137-04	7214-004	AM		11/10/99	11/12/99	NJV	Americium 241 in Soil
		SOLID		7214-004	GAM		10/27/99	11/03/99	NJV	Gamma Scan
	B99-078			7214-004	H		10/28/99	11/03/99	NJV	Tritium in Soil
				7214-004	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil
				7214-004	NP		11/08/99	11/12/99	NJV	Neptunium in Soil
				7214-004	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids
				7214-004	SR		11/10/99	11/12/99	NJV	Total Strontium in Soil
				7214-004	TC		10/27/99	11/03/99	NJV	Technetium 99 in Soil
				7214-004	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil
				7214-004	U_T		10/18/99	11/03/99	NJV	Uranium, Total in Soil
Lab Control Sample			N909137-03	7214-003	AM		11/10/99	11/12/99	NJV	Americium 241 in Soil
		SOLID		7214-003	GAM		10/27/99	11/03/99	NJV	Gamma Scan
	B99-078			7214-003	H		10/27/99	11/03/99	NJV	Tritium in Soil
				7214-003	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil
				7214-003	NP		11/08/99	11/12/99	NJV	Neptunium in Soil
				7214-003	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids
				7214-003	SR		11/06/99	11/12/99	NJV	Total Strontium in Soil
				7214-003	TC		10/25/99	11/03/99	NJV	Technetium 99 in Soil
				7214-003	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil
				7214-003	U_T		10/18/99	11/03/99	NJV	Uranium, Total in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

SDG 7217
Contact Kevin C. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (N909164-01)			N909164-04	7217-004	AM		11/10/99	11/15/99	NJV	Americium 241 in Soil
200 B pond (B8758) >15'		SOLID	09/21/99	7217-004	GAM		10/29/99	11/15/99	NJV	Gamma Scan
	B99-078		09/23/99	7217-004	H		10/28/99	11/15/99	NJV	Tritium in Soil
				7217-004	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil
				7217-004	NP		11/06/99	11/15/99	NJV	Neptunium in Soil
				7217-004	PU		11/10/99	11/15/99	NJV	Plutonium, Isotopic in Solids
				7217-004	SR		11/06/99	11/15/99	NJV	Total Strontium in Soil
				7217-004	TC		10/26/99	11/15/99	NJV	Technetium 99 in Soil
				7217-004	TH		11/04/99	11/15/99	NJV	Thorium, Isotopic in Soil
				7217-004	U_T		10/20/99	11/15/99	NJV	Uranium, Total in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-078	Americium 241 in Soil	AM/CMPLATE	1			1	1	1	4
GAM	B99-078	Gamma Scan	GAMMAHI	1			1	1	1	4
H	B99-078	Tritium in Soil	EPA906.0	1			1	1	1	4
NI_L	B99-078	Nickel 63 in Soil	NI63LSC	1			1	1	1	4
NP	B99-078	Neptunium in Soil	NP237PLATE	1			1	1	1	4
PU	B99-078	Plutonium, Isotopic in Solids	PUPLATE	1			1	1	1	4
SR	B99-078	Total Strontium in Soil	SRTOTAL	1			1	1	1	4
TC	B99-078	Technetium 99 in Soil	TC99TRLSC	1			1	1	1	4
TH	B99-078	Thorium, Isotopic in Soil	THPLATE	1			1	1	1	4
U_T	B99-078	Uranium, Total in Soil	UKPA	1			1	1	1	4
TOTALS				10			10	10	10	40

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/15/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0541

N909137-04 Method Blank

METHOD BLANK

SDG 7217 Client/Case no Hanford SDG H0541
Contact Kevin C. Johnson Contract TRB-SBB-207925

Lab sample id N909137-04 Client sample id Method Blank
Dept sample id 7214-004 Material/Matrix SOLID
SAF No B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.024	0.050	0.084	400	U	H
Technetium 99	14133-76-7	1.50	0.22	0.48	15	J	TC
Neptunium 237	13994-20-2	0.021	0.028	0.021			NP
Total Uranium (ug/g)	7440-61-1	-0.001	0.002	0.005	1.0	U	U_T
Plutonium 238	13981-16-3	-0.013	0.10	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0.025	0.076	0.16	1.0	U	PU
Nickel 63	13981-37-8	0.520	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.004	0.016	0.030	1.0	U	AM
Total Strontium	SR-RAD	-0.111	0.13	0.19	1.0	U	SR
Thorium 228	14274-82-9	-0.027	0.054	0.12	1.0	U	TH
Thorium 230	14269-63-7	-0.013	0.080	0.15	1.0	U	TH
Thorium 232	TH-232	0.013	0.027	0.051	1.0	U	TH
Potassium 40	13966-00-2	U		0.66		U	GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Cesium 137	10045-97-3	U		0.044	0.10	U	GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.091	0.10	U	GAM
Radium 226	13982-63-3	U		0.076	0.10	U	GAM
Radium 228	15262-20-1	U		0.19	0.20	U	GAM
Thorium 228	14274-82-9	U		0.054		U	GAM
Thorium 232	TH-232	U		0.19		U	GAM
Americium 241	14596-10-2	U		0.098		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Uranium 235	15117-96-1	U		0.14		U	GAM

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 32094

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

N909137-03 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7217 Client/Case no Hanford SDG H0541

Contact Kevin C. Johnson Case no TRB-SBB-207925

Lab sample id N909137-03 Client sample id Lab Control Sample

Dept sample id 7214-003 Material/Matrix SOLID

SAF No B99-078

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	4.89	0.15	0.084	400	J	H	4.84	0.19	101	83-117	80-120
Technetium 99	52.0	1.8	0.47	15	B	TC	54.1	2.2	96	84-116	80-120
Neptunium 237	11.0	0.65	0.049			NP	11.9	0.48	92	88-112	
Total Uranium (ug/g)	34.8	4.1	0.049	1.0		U_T	41.2	1.6	84	80-120	80-120
Plutonium 238	9.48	0.88	0.053	1.0		PU	10.0	0.40	95	84-116	80-120
Plutonium 239/240	9.93	0.92	0.043	1.0		PU	10.6	0.42	94	84-116	80-120
Nickel 63	132	3.5	1.9	30		NI_L	134	5.4	99	84-116	
Americium 241	10.4	0.77	0.047	1.0		AM	10.5	0.42	99	85-115	80-120
Total Strontium	13.6	0.41	0.17	1.0		SR	12.4	0.50	110	82-118	
Thorium 230	22.5	1.1	0.16	1.0		TH	20.4	0.82	110	87-113	
Cobalt 60	1.36	0.066	0.029	0.050		GAM	1.49	0.060	91	78-122	80-120
Cesium 137	1.44	0.056	0.035	0.10		GAM	1.54	0.062	94	77-123	80-120

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 32093

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

N909164-04

B0WBT3

DUPLICATE

SDG 7217 | Client/Case no Hanford | SDG H0541

Contact Kevin C. Johnson | Case no TRB-SBB-207925

DUPLICATE		ORIGINAL	
Lab sample id N909164-04		Lab sample id N909164-01	Client sample id B0WBT3
Dept sample id 7217-004		Dept sample id 7217-001	Location/Matrix 200 B pond (B8758) >15' SOLID
		Received 09/23/99	Collected 09/21/99 12:50
% solids 93.1		% solids 93.1	Custody/SAF No B99-078-122 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Tritium	0.162	0.057	0.086	400	J	H	0.089	0.055	0.088	J	58	97
Technetium 99	1.56	0.24	0.42	15	JB	TC	1.57	0.37	0.43	JB	1	47
Neptunium 237	0	0.011	0.043		U	NP	0.017	0.034	0.081	U	-	
Total Uranium (ug/g)	0.334	0.038	0.005	1.0	J	U_T	0.380	0.043	0.005	J	13	31
Plutonium 238	0	0.016	0.046	1.0	U	PU	-0.004	0.017	0.048	U	-	
Plutonium 239/240	0.012	0.033	0.055	1.0	U	PU	0	0.017	0.048	U	-	
Nickel 63	0.496	1.3	2.2	30	U	NI_L	0.198	1.2	2.0	U	-	
Americium 241	0.004	0.015	0.029	1.0	U	AM	0.015	0.015	0.029	U	-	
Total Strontium	0.046	0.12	0.20	1.0	U	SR	0.029	0.12	0.20	U	-	
Thorium 228	0.793	0.19	0.13	1.0	J	TH	0.761	0.16	0.12	J	4	49
Thorium 230	0.705	0.19	0.18	1.0	J	TH	0.328	0.13	0.14	J	73	68
Thorium 232	0.705	0.17	0.080	1.0	J	TH	0.713	0.14	0.049	J	1	48
Potassium 40	11.2	0.95	0.49			GAM	7.82	1.6	1.2		36	44
Cobalt 60	U		0.051	0.050	U	GAM	U		0.092	U	-	
Cesium 137	U		0.046	0.10	U	GAM	U		0.083	U	-	
Europium 152	U		0.11	0.10	U	GAM	U		0.22	U	-	
Europium 154	U		0.15	0.10	U	GAM	U		0.29	U	-	
Europium 155	U		0.089	0.10	U	GAM	U		0.23	U	-	
Radium 226	0.431	0.099	0.098	0.10		GAM	0.354	0.15	0.18		20	76
Radium 228	0.704	0.25	0.24	0.20		GAM	0.301	0.30	0.42	U	80	122
Thorium 228	0.652	0.056	0.052			GAM	0.743	0.11	0.10		13	41
Thorium 232	0.704	0.25	0.24			GAM	0.301	0.30	0.42	U	80	122
Americium 241	U		0.11		U	GAM	U		0.26	U	-	
Uranium 238	U		6.0		U	GAM	U		10	U	-	
Uranium 235	U		0.15		U	GAM	U		0.29	U	-	

200 Area Source chrctztn-200-CW-1 OU

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/15/99

DUPLICATE, cont.

SDG 7217		Client/Case no Hanford	SDG H0541
Contact Kevin C. Johnson		Case no TRB-SBB-207925	
DUPLICATE	ORIGINAL		
Lab sample id N909164-04	Lab sample id N909164-01	Client sample id B0WBT3	
Dept sample id 7217-004	Dept sample id 7217-001	Location/Matrix 200 B pond (B8758) >15'	SOLID
	Received 09/23/99	Collected 09/21/99 12:50	
% solids 93.1	% solids 93.1	Custody/SAF No B99-078-122	B99-078

QC-DUP#1 32222

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/15/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0541

N909164-01 B0WBT3

DATA SHEET

SDG	7217	Client/Case no	Hanford SDG H0541
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909164-01	Client sample id	B0WBT3
Dept sample id	7217-001	Location/Matrix	200 B pond (B8758) >15' SOLID
Received	09/23/99	Collected	09/21/99 12:50
% solids	93.1	Custody/SAF No	B99-078-122 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.089	0.055	0.088	400	J	H
Technetium 99	14133-76-7	1.57	0.37	0.43	15	JB	TC
Neptunium 237	13994-20-2	0.017	0.034	0.081		U	NP
Total Uranium (ug/g)	7440-61-1	0.380	0.043	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	-0.004	0.017	0.048	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.017	0.048	1.0	U	PU
Nickel 63	13981-37-8	0.198	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.015	0.015	0.029	1.0	U	AM
Total Strontium	SR-RAD	0.029	0.12	0.20	1.0	U	SR
Thorium 228	14274-82-9	0.761	0.16	0.12	1.0	J	TH
Thorium 230	14269-63-7	0.328	0.13	0.14	1.0	J	TH
Thorium 232	TH-232	0.713	0.14	0.049	1.0	J	TH
Potassium 40	13966-00-2	7.82	1.6	1.2			GAM
Cobalt 60	10198-40-0	U		0.092	0.050	U	GAM
Cesium 137	10045-97-3	U		0.083	0.10	U	GAM
Europium 152	14683-23-9	U		0.22	0.10	U	GAM
Europium 154	15585-10-1	U		0.29	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Radium 226	13982-63-3	0.354	0.15	0.18	0.10		GAM
Radium 228	15262-20-1	0.301	0.30	0.42	0.20	U	GAM
Thorium 228	14274-82-9	0.743	0.11	0.10			GAM
Thorium 232	TH-232	0.301	0.30	0.42		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Uranium 238	U-238	U		10		U	GAM
Uranium 235	15117-96-1	U		0.29		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

Test AM Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Americium 241	
Preparation batch 6904-018						
B0WBT3	N909164-01			7217-001	U	
BLK (QC ID=32094)	N909137-04			7214-004	U	
LCS (QC ID=32093)	N909137-03			7214-003	ok	
Duplicate (N909164-01)	N909164-04			7217-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200 Area Source chrctztn-200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018	2σ prep error 5.0 %	Reference Lab Notebook 6904 pg. 018														
B0WBT3	N909164-01			0.029	0.500			79		765			50	11/08/99	11/10	SS-062
BLK (QC ID=32094)	N909137-04			0.030	0.500			78		793				11/08/99	11/10	SS-016
LCS (QC ID=32093)	N909137-03			0.047	0.500			73		793				11/08/99	11/10	SS-015
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.029	0.500			78		769			50	11/08/99	11/10	SS-063
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.034 ± 0.018
YIELD 77 ± 5

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

NEPTUNIUM IN SOIL

ALPHA SPECTROSCOPY

Test NP Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237
Preparation batch 6904-018					
B0WBT3	N909164-01			7217-001	U
BLK (QC ID=32094)	N909137-04			7214-004	0.021
LCS (QC ID=32093)	N909137-03			7214-003	ok
Duplicate (N909164-01)	N909164-04			7217-004	- U
Nominal values and limits from method					RDLs (pCi/g)
200 Area Source chrctztn-200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-018	2σ prep error 5.0 %	Reference Lab Notebook 6904 pg. 018														
B0WBT3	N909164-01			0.081	0.500			30		200			46	11/03/99	11/06	BETA
BLK (QC ID=32094)	N909137-04			0.021	0.500			30		200				11/03/99	11/08	BETA
LCS (QC ID=32093)	N909137-03			0.049	0.500			39		200				11/03/99	11/08	BETA
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.043	0.500			38		200			46	11/03/99	11/06	BETA
Nominal values and limits from method					0.500			20-105		100						

PROCEDURES	REFERENCE	NP237PLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-930	Neptunium Purification, rev 0

AVERAGES ± 2 SD	MDA	0.048 ± 0.050
FOR 4 SAMPLES	YIELD	34 ± 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test PU Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6904-018								
B0WBT3	N909164-01			7217-001	U		U	
BLK (QC ID=32094)	N909137-04			7214-004	U		U	
LCS (QC ID=32093)	N909137-03			7214-003	ok		ok	
Duplicate (N909164-01)	N909164-04			7217-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200 Area Source chrctztn-200-CW-1 OU								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018	2σ prep error 5.0 %			Reference Lab Notebook 6904 pg. 018												
B0WBT3	N909164-01			0.048	0.500			45		1246			50	11/09/99	11/10	SS-013
BLK (QC ID=32094)	N909137-04			0.19	0.500			24		795				11/09/99	11/10	SS-009
LCS (QC ID=32093)	N909137-03			0.053	0.500			53		760				11/09/99	11/10	SS-055
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.055	0.500			46		1246			50	11/09/99	11/10	SS-014
Nominal values and limits from method				1.0	0.500			20-105		10	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.086 ± 0.14
YIELD 42 ± 25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test TH Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SRB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6904-018							
BOWBT3	N909164-01			7217-001	0.761 J	0.328 J	0.713 J
BLK (QC ID=32094)	N909137-04			7214-004	U	U	U
LCS (QC ID=32093)	N909137-03			7214-003		ok	
Duplicate (N909164-01)	N909164-04			7217-004	ok J	OUT J	ok J
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0
200 Area Source chrctztn-200-CW-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 018																
BOWBT3	N909164-01			0.14	0.250			92		772			42	11/01/99	11/02	SS-045
BLK (QC ID=32094)	N909137-04			0.15	0.250			87		783				11/01/99	11/02	SS-032
LCS (QC ID=32093)	N909137-03			0.16	0.250			86		783				11/01/99	11/02	SS-031
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.18	0.250			87		523			44	11/01/99	11/04	SS-027
Nominal values and limits from method				1.0	0.250			20-105		200			180			

PROCEDURES	REFERENCE	THPLATE
	EP-000	Data Entry and Document Preparation, rev 0
	EP-001	Q.C. Preparation, rev 0
	EP-003	Tracing, rev 0
	EP-008	Heavy Elements Electroplating, rev 0
	EP-070	Soil Dissolution, rev 0
	RP-901	Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.16 ± 0.034
YIELD 88 ± 5

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Test SR Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium	
Preparation batch 6904-018						
B0WBT3	N909164-01			7217-001	U	
BLK (QC ID=32094)	N909137-04			7214-004	U	
LCS (QC ID=32093)	N909137-03			7214-003	ok	
Duplicate (N909164-01)	N909164-04			7217-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200 Area Source chrctztn-200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018	2σ prep error 10.0 %			Reference Lab Notebook 6904 pg. 018												
B0WBT3	N909164-01			0.20	1.00			85		200			46	11/05/99	11/06	GRB-202
BLK (QC ID=32094)	N909137-04			0.19	1.00			74		400				11/05/99	11/10	GRB-220
LCS (QC ID=32093)	N909137-03			0.17	1.00			81		400				11/05/99	11/06	GRB-219
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.20	1.00			83		200			46	11/05/99	11/06	GRB-203
Nominal values and limits from method				1.0	1.00					100			180			

PROCEDURES	REFERENCE	SRTOTAL
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.19 ± 0.028
YIELD 81 ± 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Test TC Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Technetium 99	
Preparation batch 6904-018						
B0WBT3	N909164-01			7217-001	1.57	J
BLK (QC ID=32094)	N909137-04			7214-004	1.50	J
LCS (QC ID=32093)	N909137-03			7214-003	ok	
Duplicate (N909164-01)	N909164-04			7217-004	ok	J
Nominal values and limits from method				RDLs (pCi/g)	15	
200 Area Source chrctztn-200-CW-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018	2σ prep error 10.0 %				Reference Lab Notebook 6904 pg. 018											
B0WBT3	N909164-01			0.43	1.02			78	101				34	10/21/99	10/25	GRB-230
BLK (QC ID=32094)	N909137-04			0.48	1.01			71	101					10/21/99	10/27	GRB-230
LCS (QC ID=32093)	N909137-03			0.47	1.01			73	101					10/21/99	10/25	GRB-220
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.42	1.02			77	101				35	10/21/99	10/26	GRB-224
Nominal values and limits from method				15	1.02			20-105	50				180			

PROCEDURES	REFERENCE	TC99TRLSC
	EP-060	Soil Preparation, rev 0
	EP-020	Sample Leach For Technetium-99, rev 0
	EP-540	Technetium-99 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.45 ± 0.059
YIELD 75 ± 7

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 6904-018								
B0WBT3	N909164-01			7217-001	U		U	
BLK (QC ID=32094)	N909137-04			7214-004	U		U	
LCS (QC ID=32093)	N909137-03			7214-003	ok		ok	
Duplicate (N909164-01)	N909164-04			7217-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
200 Area Source chrctztn-200-CW-1 OU								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 018																
B0WBT3	N909164-01			0.22	54.6					410			43	10/11/99	11/03	PD,03,00
BLK (QC ID=32094)	N909137-04			0.082	167					402				10/08/99	10/27	JR,03,00
LCS (QC ID=32093)	N909137-03			0.029	167					454				10/08/99	10/27	JR,04,00
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.12	54.6					486			38	10/11/99	10/29	PD,04,00
Nominal values and limits from method				0.050	55.0					100			180			

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.11 ± 0.16
YIELD _____ ± _____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

Test U T Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 6904-018					
B0WBT3	N909164-01			7217-001	0.380 J
BLK (QC ID=32094)	N909137-04			7214-004	U
LCS (QC ID=32093)	N909137-03			7214-003	ok
Duplicate (N909164-01)	N909164-04			7217-004	ok J
Nominal values and limits from method				RDLs (ug/g)	1.0
200 Area Source chrctztn-200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6904-018	2σ prep error 9.0 %			Reference Lab Notebook 6904 pg. 018												
B0WBT3	N909164-01			0.005	0.0500								29	10/20/99	10/20	KPA-001
BLK (QC ID=32094)	N909137-04			0.005	0.0500									10/18/99	10/18	KPA-001
LCS (QC ID=32093)	N909137-03			0.049	0.0500									10/18/99	10/18	KPA-001
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.005	0.0500								29	10/20/99	10/20	KPA-001
Nominal values and limits from method				1.0	0.0500								180			

PROCEDURES	REFERENCE	UKPA
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-044	Preparation of Total Uranium by Kinetic Phosphorimetry, rev 1
	EP-928	Total Uranium by Kinetic Phosphorimetry, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.016 ± 0.044
YIELD _____ ± _____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Test H Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Tritium	
Preparation batch 6904-018						
B0WBT3	N909164-01			7217-001	0.089	J
BLK (QC ID=32094)	N909137-04			7214-004	U	
LCS (QC ID=32093)	N909137-03			7214-003	ok	J
Duplicate (N909164-01)	N909164-04			7217-004	ok	J

Nominal values and limits from method RDLs (pCi/g) 400
200 Area Source chrctztn-200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018	2σ prep error 10.0 %			Reference Lab Notebook 6904 pg. 018												
B0WBT3	N909164-01			0.088	20.0			100		120			36	10/27/99	10/27	LSC-005
BLK (QC ID=32094)	N909137-04			0.084	20.3			100		120				10/27/99	10/28	LSC-005
LCS (QC ID=32093)	N909137-03			0.084	20.3			100		120				10/27/99	10/27	LSC-005
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.086	20.2			100		120			37	10/27/99	10/28	LSC-005
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES
REFERENCE EPA906.0
EP-060 Soil Preparation, rev 0
EP-211 Tritium in Solid Samples by Azeotropic Distillation, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.086 ± 0.004
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0541

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Nickel 63
Preparation batch 6904-018					
B0WBT3	N909164-01			7217-001	U
BLK (QC ID=32094)	N909137-04			7214-004	U
LCS (QC ID=32093)	N909137-03			7214-003	ok
Duplicate (N909164-01)	N909164-04			7217-004	- U
Nominal values and limits from method				RDLs (pCi/g)	30
200 Area Source chrctztn-200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 018																
B0WBT3	N909164-01			2.0	0.500			89	100				51	11/10/99	11/11	LSC-005
BLK (QC ID=32094)	N909137-04			2.0	0.500			92	100					11/10/99	11/11	LSC-005
LCS (QC ID=32093)	N909137-03			1.9	0.500			95	100					11/10/99	11/11	LSC-005
Duplicate (N909164-01) (QC ID=32222)	N909164-04			2.2	0.500			83	100				51	11/10/99	11/11	LSC-005
Nominal values and limits from method				30	0.500					10			180			

PROCEDURES REFERENCE NI63LSC
EP-060 Soil Preparation, rev 0
EP-431 Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2.0 ± 0.25
YIELD 90 ± 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-122	Page 1 of 1

Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078
Ice Chest No. SML 579	Field Logbook No. EL-1511		Method of Shipment Fed Ex
Shipped To ~~TMA/RECRA~~ DTB 9-21-99 TMA	Offsite Property No. A990265		Bill of Lading/Air Bill No. 4235 7952 9675
			COA B20CW1 67/C

Price Code 8N

Data Turnaround
45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
~~B0WBT2~~ DTB 9-21-99	Soil												
2 B0WBT3	Soil	9-21-99	1250			X				DownCAL			
~~B0WBT4~~ DTB	Soil												
~~B0WBT5~~ 9-21-99	Soil												

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers	Date/Time 9-21-99/1630	Received By Ref 1B	Date/Time 9-21-99/1630
Relinquished By Ref 1B	Date/Time 9-22-99 1100	Received By C Trice	Date/Time 9/22/99 1100
Relinquished By C Trice	Date/Time 9/22/99 1400	Received By FEDEX	Date/Time 9/22/99 1400
Relinquished By Fed Ex	Date/Time 9-23-99 1610	Received By J R Corso	Date/Time 9-23-99 1610

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 9-23-99 11:01

CoC No. B99-078-122

Container I.D. No. SML-579 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Cooler Temperature: _____	Packing material is:	Wet [ ]	Dry [✓]
6.	Number of samples in shipping container: 1			
7.	Number of containers per sample: 1 (Or see CoC _____)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			

11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____

14. Received by JC Cruz Date: 9-23-99 Time: 11:01

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____